NON-PUBLIC?: N
ACCESSION #: 9111190266
LICENSEE EVENT REPORT (LER)

FACILITY NAME: South Texas, Unit 1 PAGE: 1 OF 4

DOCKET NUMBER: 05000498

TITLE: Reactor Trip During Performance of SSPS Logic Functional Test
EVENT DATE: 10/14/91 LER #: 91-022-00 REPORT DATE: 11/13/91

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Charles Ayala - Supervising Licensing Engineer TELEPHONE: (512) 972-8628

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On October 14, 1991, at 2304 hours, Unit 1 was in Mode 1 at 100% power. Solid State Protection System (SSPS) Logic Train R Functional Test was in progress when the Licensed Operator performing the surveillance misunderstood the intent of a note in the procedure and failed to block the Turbine Trip signal before proceeding to the next step. The "Memories" test switch was placed in position 16 and an automatic Train R trip signal was generated. Train R trip signal generated a "Turbine Trip upon Reactor Trip" signal which had not been blocked and the "Memories" test switch also malfunctioned, which if it had functioned properly should have also blocked the trip signal. Subsequently, the Main Turbine tripped and, coincident with a "Reactor Power Above 50%" signal, a valid Train S Reactor Trip signal was generated tripping the reactor. The cause of this event was personnel error by the Licensed Operator who exercised poor judgement while performing the test. Contributing factors were a less than ideal procedure and the malfunction of the "Memories"

test switch. Corrective actions include site-wide training sessions for appropriate plant personnel stressing the application of self verification during work performance, counseling of the licensed operator involved in the event, revision of all SP series surveillances performed at power that have the potential to trip the unit/main turbine, to specifically require that an appropriate turbine/reactor trip block be instituted whenever there is a possibility that the SSPS will generate an unwanted trip signal.

END OF ABSTRACT

DESCRIPTION OF EVENT:

On October 14, 1991, at 2304 hours Unit 1 was in Mode 1 at 100% power. The Memories portion of the Solid State Protection System (SSPS) Train R Functional Test was in progress when the Licensed Operator performing the surveillance, misunderstood the intent of a note prior to step 7.5.1 in this procedure. This note stated that "If turbine is not latched, the performance of steps 7.5.1 and 7.5.2 is optional." These two steps were omitted, preventing the blocking of Turbine Trip and therefore, the turbine trip function did not get blocked.

The next steps performed were a series of "memories" tests. These tests place an input in an appropriate place in the logic and verify outputs. For the portion of the test that caused the trip, the input is placed on the Steam Generator Lo Lo level signal to test auxiliary feed memories. By design, the reactor trip function of the Lo Lo level is blocked by the same switch. The normal function of position 16 is to generate a test signal which is blocked from actually causing equipment trip actuations. The blocking function of the switch failed. This allowed the trip signal to open the reactor trip breaker. The breaker opened but, since the bypass breaker was closed, no trip of the reactor occurred. The reactor trip signal also caused a turbine trip signal which was not blocked. This turbine trip caused a redundant reactor trip signal which opened the Train S reactor trip breaker and caused a trip of the reactor.

Feedwater isolation occurred on low Reactor Coolant System (RCS) average temperature, and Auxiliary Feedwater (AFV) actuated on low-low steam generator level. The Main Steam Isolation Valves were manually closed to minimize the RCS cooldown. Control room personnel responded in accordance with the Emergency Operating Procedures and stabilized the plant. The NRC was notified of the event at 0100 on October 15, 1991.

NOTE

The "Memories" test switch, by design, is supposed to block both a turbine trip and a reactor trip before it generates the test trip signal. The Westinghouse technical manual recognizes the potential for equipment failure and recommends that the corresponding bypass breaker be closed during testing to preclude a reactor trip, although it fails to mention the turbine trip. In fact, Reactor Trip Breaker R opened approximately 4.5 seconds before the turbine trip, indicating some type of switch malfunctioning. The switch has malfunctioned at least once in the past and was responsible for a similar previous event. The subject note and procedure steps were added to the surveillance as a "backup" for possible switch malfunctions.

CAUSE OF EVENT:

The cause of this event was personnel error by the Licensed Operator, in exercising poor judgement while performing the test. The operator expressed uncertainty about the intent of the note, but he did so to a non-licensed operator who was not trained on the SSPS to the extent necessary to answer technical questions of this nature.

A contributing factor is that the note prior to step 7.5.1 in the surveillance procedure was unclear to the operator in that it required an "if - then" logic decision and then made the decision optional to perform the subsequent steps. Another factor in this event is that the "Memories" test switch occasionally makes the actuation circuit before making the blocking circuit. The switch has malfunctioned at least once in the past and caused a similar turbine trip. This trip would not have occurred, even with the omitted procedure steps, if the switch had not malfunctioned again.

ANALYSIS OF EVENT:

Unplanned Reactor Protection System actuation is reportable pursuant to 10CFR50.73(a)2(iv). The reactor tripped as required and plant equipment operated as expected. There were no adverse radiological or safety consequences as a result of this event.

CORRECTIVE ACTIONS:

The following corrective actions have been taken as a result of this event:

1. The applicable section of the surveillance was re-performed two

times without incident following the reactor trip.

2. Site-wide training sessions are being held for appropriate plant personnel stressing the application of Self Verification during work performance. To date, the majority of plant personnel have attended one of these sessions. The remainder of these training sessions will be completed by November 22, 1991.

3. Plant Operations Management has conveyed to their employees the additional expectation that they will maintain a "questioning attitude" with regard to their job performance.

4. The Licensed Operator involved in the event has been counseled by stressing the importance of sound judgement and use of a team concept.

CORRECTIVE ACTIONS: (Cont'd)

5. Engineering will revise all of the SP-Series surveillances performed at power that have the potential to trip the unit/main turbine, to specifically and clearly require that an appropriate turbine/reactor trip block be instituted whenever there is a possibility that the SSPS will generate an unwanted trip signal. This revision will be completed by February 28, 1992.

6. STPEGS will evaluate possible replacement switches or alternate test methods for the Solid State Protection System. This action will be completed by June 30, 1992.

7. The Reactor Operator Qualification Card will be revised to require that all applicable SSPS surveillance practical factors be implemented by "Perform" or "Simulate" options and eliminate the qualification by the "Discuss" option. This action will be completed December 1, 1991.

ADDITIONAL INFORMATION:

One previous event has been reported, LER 90-020 (Unit 1), regarding a reactor trip during performance of a Solid State Protection System surveillance test procedure.

The Light

company South Texas Project Electric
Houston Lighting & Power Generating Station P. O. Box 289
Wadsworth, Texas 77483

November 13, 1991
ST-HL-AE-3924
File No.: G26
10CFR50.73

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project Electric Generating Station
Unit 1
Docket No. STN 50-498
Licensee Event Report 91-022 Regarding A
Reactor Trip During Performance of SSPS Logic Functional Test

Pursuant to 10CFR50.73, Houston Lighting & Power (HL&P) submits the attached Licensee Event Report (LER 91-022) regarding a reactor trip during performance of SSPS logic functional test. This event did not have any adverse impact on the health and safety of the public.

If you should have any question on this matter, please contact Mr. C. A. Ayala at (512) 972-8628 or myself at (512) 972-7205.

William J. Jump
Manager,
Nuclear Licensing

JMP/amp

Attachment: LER 91-022 (South Texas, Unit 1)

LER\913-4001.U1

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ATTACHMENT 1 TO 9111190266 PAGE 2 OF 2

Houston Lighting & Power Company
South Texas Project Electric Generating Station ST-HL-AE-3924
File No.: G26
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cc:

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Revised 10/11/91

LER.CC

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